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MANAGEMENT OF AFRICANIZED HONEY BEE COLONIES IN DEVELOPED RECREATION SITES

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INTRODUCTION

Developed recreation sites on public lands in California have many suitable nest sites for Africanized honey bees (AHB), including cavities in buildings, debris, and hollow trees. Some of these sites are currently occupied by docile European honey bees (EHB). All feral honey bee colonies in campgrounds and other high use areas are an important issue because of the imminent arrival of the AHB. Feral colonies which now contain European honey bees will be taken over by African queens and will then become extremely defensive and hazardous to humans, pets, and livestock (including horses) in the vicinity of the nests. If the current EHB residents are removed, the hollows in which they lived will continue to be attractive as nest sites to other honey bees because of nest materials and odors left in the cavities.

Like European honey bees, Africanized honey bees are docile when they are swarming (a queen with a group of worker bees seeking out a new nestsite) and even when they first establish a nest. However, after a few weeks, when they have developing brood and honey stores, they become extremely defensive. There have been reports of colonies existing for several months around human dwellings before becoming highly defensive, thus the timing of the behavioral change is unpredictable. Established hives of AHB will respond in large numbers, with great speed, to nearby stimuli that EHB would ignore, such as dogs and vibrating equipment (e.g., weed eaters and chainsaws). In addition there is evidence that feral AHB colonies occur in much higher densities than feral EHB colonies, thus regardless of management actions taken, the number of bee/human interactions should increase after the arrival of the AHB.

Note that the taking over of EHB colonies by African queens should not be a significant problem in managed hives. Beekeepers will requeen or destroy colonies that become aggressive and difficult to manage.

At this point it is unclear how liability laws will be applied to incidents involving Africanized honey bees on public lands. One legal opinion holds that warning signs are enough to absolve an agency of liability, while another expert has stated that any improvement - such as a picnic table or outhouse -

constitutes an invitation for use by the public and an implication of safety. Clearly prevention of stinging incidents is the best policy.

MANAGEMENT OPTIONS

Managing Africanized honey bees in developed recreation sites on public lands will be challenging and costly, but because of health and safety, these insects cannot be ignored. Following are some options for managing AHB in campgrounds and picnic areas.

1. **Do nothing.** Under this option, AHB will take over feral EHB colonies as well as establishing their own nests in cavities and other suitable sites. There will be stinging incidents, and some may be quite serious. Persons unable to run from attacking bees, such as the young, the elderly, and the disabled, would suffer multiple stings. Persons who are highly allergic to bee venom would be at great risk, and because of the remote location of some of the sites, emergency medical assistance may not reach these individuals in time to prevent mortality. In addition to human victims, penned or tied livestock and pets are likely to be killed. In a recent incident in Tucson a colony of AHB attacked and killed an 8-month-old German shepherd dog which was tied to a tree. Subsequently over 3,000 stingers were removed from the animal, with more than 2,400 in the face and head (AHB are attracted to mammalian faces).

2. **Close infested developed recreation sites.** This option would reduce the likelihood of bee-human interactions, and may be useful at least on a temporary basis.

3. **Survey and removal.** Under this option developed recreation sites would be frequently (e.g., once a week) surveyed for bee activity. Bees can be expected to nest in man-made structures, including buildings, hollow pipes, construction and other debris, and in natural cavities such as hollow trees and burrows in the ground, and sometimes in exposed areas such as hanging from branches of trees. Campground hosts and the public could be encouraged to report colonies within 100 yards of campgrounds and day-use areas and around trails; however, **THE PUBLIC MUST BE ADVISED TO NOT DISTURB BEE COLONIES OR THE BEES MAY ATTACK.** Colonies in and around developed recreation sites would be removed, while trails with known colonies could be signed. **NOTE THAT COLONIES OR SWARMS SHOULD NOT BE KILLED OR REMOVED BY PERSONS NOT SPECIFICALLY TRAINED IN METHODS OF CONTROLLING AFRICANIZED HONEY BEES, NOR SHOULD BEE CONTROL WORK BE UNDERTAKEN WITHOUT APPROPRIATE PROTECTIVE CLOTHING AND SAFETY PRECAUTIONS.** Land managers may chose to have bee removal work done by qualified pest control operators. In hollow oaks, "removing" colonies might consist of killing the bees with a dust or fumigant, then plugging all holes into the tree with insect screen, 1/8 inch hardware cloth, or concrete or insulating foam (the aerosol type that expands and hardens when applied). Although filling tree cavites with concrete has in the past been thought to increase the rate of heartrot, that has not been shown to be the case, and land managers should chose the most efficacious and economical method. The best method will have to be determined empirically. The sooner bees are removed after discovery, the better, as the longer a colony is in place, the more likely it is to become highly defensive and difficult to eradicate.

In other cavities, a fumigant can be used to kill the bees, but further action depends on the nature of the cavity. If the nest is in the wall of a building, the wall must be opened and all nest material and dead bees removed, then the wall sealed to prevent reinvasion.

A swarm (a colony of bees away from a hive) presents a special situation. Swarms often alight overnight, then continue their migration the following day. Thus it is prudent to wait a day before killing a swarm. Because they are exposed (rather than in a cavity) and usually (but not always) docile, swarms are much easier to kill than colonies. Careful wetting down with water and insecticidal soap will usually suffice. The dead bees should be removed to prevent accidental stinging if they are stepped on or ingested. Bee experts often use a tarp under the swarm to collect the dying bees as they fall.

Attempting to remove bees in less-utilized areas, such as along trails, is probably not economically feasible. Similarly, although removing feral bees from wildlands in general may be desirable from the standpoint of ecosystem management (Apis mellifera is not native to the New World), it is simply not possible to do so. Furthermore, it should be noted that our agricultural system is absolutely dependent on honey bees for pollination of crops.

4. **Trap out incoming swarms.** This is a newly-developed method and has not been tested for efficacy in wildland situations. Swarm traps (cardboard or fiberboard boxes with pheromone bait) are placed around the perimeter of the area to be protected. The aim of this method is for incoming swarms to nest in the traps rather than in other cavities. The occupied traps are removed and the bees killed.

5. **Prevention.** A study in a rural region of Panama showed that Africanized honey bees most commonly nest in man-made structures. Therefore bee problems can be prevented to a great extent by cleaning up debris and beeproofing buildings. Beeproofing is described in the attached leaflet, "Bee Alert: Africanized Honey Bee Facts," produced by the University of California, Cooperative Extension.

CONCLUSIONS AND FURTHER CONSIDERATIONS

More than one of the management approaches listed above might be used, depending on the situation. Keeping bees out of developed recreation sites will require a considerable commitment of resources. In addition, we have no experience with this insect in southern California, and we will be rethinking our management of it as time passes. In the long term we will learn to live with the Africanized honey bees. Typically when the bees invade an area, the first year or two is the worst in terms of stinging incidents and other problems.

One recent development has been the unexpected delay in finding the AHB in California. The area around Yuma, AZ, has been Africanized (colonized by AHB) for months, and it is surprising that the bees have not been found in the Imperial Valley or in eastern Riverside County (the bees tend to follow waterways and could be expected to move up the Colorado River and into eastern Riverside County). The most plausible explanations include the following: the bees have crossed the Colorado River into California but have not yet been

detected, or the bees have in fact been delayed by various agents including competition for scarce nectar from feral Egyptian bees and managed bees in hives, lack of water and forage in the desert, and impact of the varroa mite (a pest of honey bees) on the AHB. Despite the apparent delay in the arrival of the bee, most experts predict that southern and coastal California, at least, will eventually be Africanized. The bees have, on the average, moved 200 - 300 miles a year since their accidental release in Brazil in 1957.

A particular problem that wildland managers will encounter is the impact of AHB on wildlife. This is an area where little or no research has been done. For example, in 1985 a colony of AHB was accidentally introduced into and was subsequently eradicated from a remote area of Kern County. When the colony was discovered, the first victims had been a San Joaquin kit fox (a Federally listed species), a crow, and a jackrabbit. Any wild animal which nests in burrows or cavities which the AHB might invade, or which stumbles into a colony, could easily be killed. An appropriate response to this problem may be to monitor for wildlife impacts and take remedial actions as needed.

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